

(FILE 'HOME' ENTERED AT 09:14:20 ON 04 AUG 1997)

FILE 'REGISTRY' ENTERED AT 09:14:30 ON 04 AUG 1997

L1 1 S BETA 1,6 GLUCANASE  
SEL L1

FILE 'CA, BIOSIS, WPIDS, USPATFULL' ENTERED AT 09:15:40 ON 04 AUG 1997

L2 88 FILE CA  
L3 34 FILE BIOSIS  
L4 16 FILE WPIDS  
L5 7 FILE USPATFULL

TOTAL FOR ALL FILES

L6 145 S E1-E3  
L7 565 FILE CA  
L8 1157 FILE BIOSIS  
L9 72 FILE WPIDS  
L10 72 FILE USPATFULL

TOTAL FOR ALL FILES

L11 1866 S HARZIANUM  
L12 6 FILE CA  
L13 3 FILE BIOSIS  
L14 1 FILE WPIDS  
L15 0 FILE USPATFULL

TOTAL FOR ALL FILES

L16 10 S L11 AND L6  
L17 6 DUP REM L16 (4 DUPLICATES REMOVED)

=> d ibib ab 1-6

L17 ANSWER 1 OF 6 CA COPYRIGHT 1997 ACS

ACCESSION NUMBER: 126:329588 CA  
TITLE: Feed for fish containing biologically available  
astaxanthin from Phaffia rhodozyma  
INVENTOR(S): Robertsen, Boerre; Soerum, Unn; Guddal, Per  
Henrik  
PATENT ASSIGNEE(S): Biotec-Mackzymal As, Norway  
SOURCE: Norw., 25 pp.  
CODEN: NOXXAJ

	NUMBER	DATE
PATENT INFORMATION:	NO 180664 B	970217
APPLICATION INFORMATION:	NO 94-2631	940713
DOCUMENT TYPE:	Patent	
LANGUAGE:	Norwegian	

AB Biol. available astaxanthin from the microorganism *P. rhodozyma* for the improvement of the color of food products from fish, esp. salmon, crustaceans, or poultry, produced by the lysis of the microbial cell walls with **.beta.-1,6-glucanase**, is claimed. The prodn. of the **.beta.-1,6-glucanase**, esp. from *Trichoderma harzianum*, is also described.

L17 ANSWER 2 OF 6 CA COPYRIGHT 1997 ACS

DUPLICATE 1

ACCESSION NUMBER: 124:108954 CA  
TITLE: *Trichoderma* beta-(1-6)-endoglucanase cDNA, its

INVENTOR(S):

PATENT ASSIGNEE(S):

SOURCE:

preparation with recombinant cells, and its use  
in degrading beta-glucans  
Kofod, Lene Venke; Andersen, Lene Nonboe;  
Kauppinen, Markus Sakari; Christgau, Stephan;  
Dalboege, Henrik; Olsen, Hans Sejr  
Novo Nordisk A/S, Den.  
PCT Int. Appl., 49 pp.  
CODEN: PIXXD2

	NUMBER	DATE
PATENT INFORMATION:	WO 9531534 A1	951123
DESIGNATED STATES:	W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG	
APPLICATION INFORMATION:	WO 95-DK189	950511
PRIORITY APPLN. INFO.:	DK 94-547	940511
DOCUMENT TYPE:	Patent	
LANGUAGE:	English	

AB The invention relates to *Trichoderma harzianum* endo-

**beta. (1-6)-glucanase.**

Further, the invention relates to a DNA construct encoding the enzyme, a method of producing the enzyme, an enzyme prepn. contg. the enzyme, the use of said enzyme or said prepn. for a no. of uses including the degrdn. or modification of beta-glucan contg. materials. The cDNA for *Trichoderma harzianum* endo-**1,6-beta.-glucanase** was cloned, sequenced, and expressed in *Aspergillus oryzae*. The enzyme was purified and characterized (mol. wt., pI, pH optimum, temp. optimum, kinetic parameters) and shown to degrade pustulan.

L17 ANSWER 3 OF 6 CA COPYRIGHT 1997 ACS

DUPLICATE 2

ACCESSION NUMBER:

122:285216 CA

TITLE:

Purification and characterization of an endo-

**beta.-1,6-**

**glucanase** from *Trichoderma*

**harzianum** that is related to its

mycoparasitism

AUTHOR(S):

de la Cruz, Jesus; Pintor-Toro, Jose A.;

Benitez, Tahia; Llobell, Antonio

CORPORATE SOURCE:

Instituto de Bioquimica Vegetal y Fotosintesis,  
Universidad de Sevilla, Sevilla, 41080, Spain

SOURCE:

J. Bacteriol. (1995), 177(7), 1864-71

CODEN: JOBAAY; ISSN: 0021-9193

DOCUMENT TYPE:

Journal

LANGUAGE:

English

AB The enzymes from *Trichoderma* species that degrade fungal cell walls have been suggested to play an important role in mycoparasitic action against fungal plant pathogens. The mycoparasite *Trichoderma harzianum* produces at least two extracellular .beta.-1,6-glucanases, among other hydrolases, when it is grown on chitin as the sole carbon source. One of these extracellular enzymes was purified to homogeneity after adsorption to its substrate, pustulan, chromatofocusing, and, finally, gel filtration. The apparent mol. mass was 43,000, and the isoelec. point was 5.8. The first 15 amino acids from the N terminus of the purified protein have been sequenced. The enzyme was specific for .beta.-1,6 linkages and showed an endolytic mode of action on pustulan. Further characterization indicated that the enzyme by itself releases sol. sugars and produced hydrolytic halli on yeast cell

walls. When combined with other *T. harzianum* cell wall-degrading enzymes such as .beta.-1,3-glucanase and chitinases, it hydrolyzes filamentous fungal cell walls. The enzyme acts cooperatively with the latter enzymes, inhibiting the growth of the fungi tested. Antibodies against the purified protein also indicated that the two identified .beta.-1,6-glucanases are not immunol. related and are probably encoded by two different genes.

L17 ANSWER 4 OF 6 CA COPYRIGHT 1997 ACS DUPLICATE 3  
ACCESSION NUMBER: 123:277404 CA  
TITLE: Molecular characterization and heterologous

expression of an endo-.beta.-1  
,6-glucanase gene from the  
mycoparasitic fungus *Trichoderma*  
*harzianum*

AUTHOR(S): Lora, Jose M.; De la Cruz, Jesus; Llobell,  
Antonio; Benitez, Tahia; Pintor-Toro, Jose A.

CORPORATE SOURCE: Inst. Recursos Naturales Agrobiol., CSIC,  
Seville, E-41012, Spain

SOURCE: Mol. Gen. Genet. (1995), 247(5), 639-45  
CODEN: MGGEAE; ISSN: 0026-8925

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Hydrolytic enzymes from the filamentous fungus *Trichoderma*  
*harzianum* have been described as crit. elements of the  
mycoparasitic action of *Trichoderma* against fungal plant pathogens.  
In this report we describe the first genomic and cDNA clones  
encoding a .beta.-1,6-endoglucanase gene. The deduced protein  
sequence has limited homol. with other .beta.-glucanases. Northern  
expts. show a marked repression of mRNA accumulation by glucose.  
The protein has been successfully produced in *Saccharomyces*  
*cerevisiae* upon construction of a transcriptional fusion of the cDNA  
with a yeast promoter. This *S. cerevisiae* recombinant strain shows  
a strong lytic action on agar plates contg. .beta.-1,6-glucan.

L17 ANSWER 5 OF 6 CA COPYRIGHT 1997 ACS DUPLICATE 4  
ACCESSION NUMBER: 118:209167 CA  
TITLE: Carbon source control on .beta.-glucanases,

chitobiase and chitinase from *Trichoderma*  
*harzianum*

AUTHOR(S): de la Cruz, Jesus; Rey, Manuel; Lora, Jose M.;  
Hidalgo-Gallego, Antonio; Dominguez, Fernando;  
Pintor-Toro, Jose A.; Llobell, Antonio; Benitez,  
Tahia

CORPORATE SOURCE: Inst. Bioquim. Veg. Fotosint., Univ. Sevilla,  
Sevilla, E-41080, Spain

SOURCE: Arch. Microbiol. (1993), 159(4), 316-22  
CODEN: AMICCW; ISSN: 0302-8933

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The cell wall-degrading enzymes .beta.-glucanase and chitinase have  
been suggested to be essential for the mycoparasitic action of  
*Trichoderma* spp. against plant fungal pathogens. For this reason,  
the prodn. on different C sources of extracellular  
.beta.-1,3-glucanase, .beta.-1,6-  
glucanase, chitobiase, and chitinase was studied in a  
mycoparasitic strain of *T. harzianum*. Max.  
.beta.-glucanase sp. activities were detected in media supplemented  
with either pustulan (.beta.-1,6-glucan), nigeran  
(.alpha.-1,3-glucan alternating with .alpha.-1,4-glucan), chitin, or  
*Saccharomyces cerevisiae* or *Botrytis cinerea* purified cell walls,  
whereas the highest chitinase sp. activity was obtained in medium  
supplemented with chitin. .beta.-Glucanase, chitobiase, and  
chitinase activities showed an increase parallel to increasing  
concns. of either pustulan or chitin added to the cultures, although

the extent of this increase varied with the different enzymes. The culture filtrate of *T. harzianum* grown on these sources also showed lytic activity on purified cell walls of *S. cerevisiae* and *B. cinerea*. Enzyme synthesis seemed to be repressed by glucose, 8-hydroxyquinoline, which inhibits transcription, or cycloheximide, an inhibitor of protein synthesis.

L17 ANSWER 6 OF 6 CA COPYRIGHT 1997 ACS

ACCESSION NUMBER: 119:155803 CA

TITLE: Regulation of .beta.-1,3-glucanase synthesis in *Trichoderma harzianum*

AUTHOR(S): Rudawska, Maria; Kamoen, Oswald

CORPORATE SOURCE: Inst. Dendrol., Pol. Acad. Sci., Kornik, 62-035, Pol.

SOURCE: Arbor. Kornickie (1992), 37, 51-9

CODEN: ARKOA9; ISSN: 0066-5878

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The antagonistic fungus *T. harzianum* when grown in a synthetic liq. medium produced enzymes with high .beta.-1,3- and low .beta.-1,6-glucanase activity. The enzymes were sepd. by Sephacryl-S 200 column chromatog. The .beta.-1,3-glucanase of *T. harzianum* appears to be subjected to a dual regulation, viz., catabolic repression and substrate induction. Glucose had a repressive effect on .beta.-1,3-glucanase activity when the fungus was incubated in a high glucose medium. After removal into a low glucose medium, the catabolic repression persisted for several days. Substrate induction in the culture of *T. harzianum* may be evoked by an exogenously supplied glucan, laminarin. Laminarin stimulated glucanase prodn. only when glucose was completely exhausted. The results are discussed in the context of better understanding of glucanase regulation, which may be helpful for increasing enzyme

L1 ANSWER 1 OF 1 REGISTRY COPYRIGHT 1997 ACS  
RN 37228-69-6 REGISTRY  
CN Glucanase, 1,6-.beta.- (9CI) (CA INDEX NAME)

OTHER NAMES:

CN .beta.-1,6-Glucanase

CN 1,6-.beta.-Glucanase

MF Unspecified

CI MAN

LC STN Files: AGRICOLA, BIOBUSINESS, BIOSIS, CA, CAPLUS, CHEMLIST,  
IFICDB, IFIPAT, IFIUDB, PROMT, TOXLIT, USPATFULL

Other Sources: EINECS\*\*

(\*\*Enter CHEMLIST File for up-to-date regulatory information)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

46 REFERENCES IN FILE CA (1967 TO DATE)